

tween the stimulating cause and the height of folly to which the inflation of credit and prices may be carried. A mania is, in short, a kind of explosion of commercial folly followed by the natural collapse. The difficulty is to explain why this collapse so often comes at intervals of ten or eleven years, and I feel sure the explanation will be found in the cessation of demand from India and China occasioned by the failure of harvests there, ultimately due to changes of solar activity. Certainly the events of the last few years, as too well known to many sufferers, entirely coincide with this view, which is, nevertheless, made the subject of inconsiderate ridicule.

Hampstead, April 23

W. STANLEY JEVONS

JAMES NICOL, F.R.S.E., F.G.S.

ANOTHER of the links connecting us with the early days of geology has been severed by the death of the Professor of Natural History in the University of Aberdeen. For some years past Prof. Nicol's failing health prevented him from undertaking more work than his college duties required, so that he had somewhat fallen behind the crowd of younger aspirants to scientific reputation. It is a pleasant duty to recall his early services to geology. As far back as the year 1843 we find him contributing to the series of prize essays of the Highland Society a memoir on the geology of his native county, Peebleshire. Devoting himself with energy to the prosecution of his favourite pursuits, he prepared a useful little Guide to the Geology of Scotland, illustrated with maps and sections, and giving, from his own observations and the researches of previous writers, a compendious account of Scottish geognosy, so far as then known. Many years afterwards he published another compilation of Scottish geology in the form of a Geological Map of that country. He specially took up the mineralogical and petrographical department of geology, and showed his capacity for these subjects by publishing a text-book of mineralogy, which has kept its place as a work of reference. Appointed Assistant Secretary of the Geological Society, he in that capacity edited the Society's Journal, and had an opportunity of coming personally in contact with the foremost geologists of his time. Among those whose friendship he formed, one of the kindest and most serviceable was Murchison. Through the assistance of that active and powerful friend Nicol was appointed to the Chair of Geology at Cork, and a few years afterwards to the more lucrative post at Aberdeen, which he resigned only last year. During these years of official work he found time for a number of original papers chiefly on the geology of different parts of Scotland. Thus he returned once more to the study of the rocks of his own Tweed Valley to which he had been the first definitely to apply the term *Silurian*. In company with his friend and benefactor Murchison, he extended these observations into Ayrshire and the west of Scotland. With the same companion he visited the north-west of Scotland, and after a long journey through these regions produced an independent memoir, in which he suggested that much of the metamorphic rocks of the north-west Highlands consisted of altered Carboniferous formations. When the fossils found in the Assynt limestones proved to be unquestionably Lower Silurian he was of course compelled to retract his published suggestion. He then adopted a completely opposite view and endeavoured to prove that the rocks which he had thought might be altered Carboniferous were really the most ancient or fundamental masses of the west coast brought up everywhere to the surface again by a vast dislocation and inversion. In this view, no less than in that for which it was substituted, he was opposed by Murchison, who proved by many sections that the rocks in question really lay upon the fossiliferous limestones

and could not therefore be older than the Lower Silurian period. From the time of this dispute the late professor devoted himself chiefly to his duties at Mareschal College, where his capacity for business made him a most useful colleague. From summer to summer, however, he could resume the hammer and renew his acquaintance with old haunts or make himself familiar with new ones. In these excursions he was sometimes accompanied by an old geological friend to whom he could communicate the views he no longer cared to publish. With a kindly nature he united a certain timidity which made him shrink from publicity and led to his being less widely known than his personal qualities deserved that he should be.

NOTES

THE International Meteorological Congress was opened at Rome on Tuesday last week, nearly all the Countries of Europe being represented, as well as the United States. Prof. H. P. S. Smith and Mr. Scott represented this country. Prof. Cantoni was elected president, M. Wild, of St. Petersburg, vice-president, Dr. Hoffmeyer, of Copenhagen, and Mr. Scott, secretaries. The introductory address was given by M. Depretis, who spoke of the great influence exercised by the physical sciences on the progress of the other sciences, and consequently on the moral and economical development of nations. He referred to the important place of meteorology among the physical sciences, and concluded by welcoming the strangers to Italy. Dr. Buys Ballot was unable to be present, but Prof. Mascart read an address sent by him, full of scientific data and statistics, passing in review all the discoveries recently made in America and Europe in meteorological science. The report on the work of the permanent committee was read by the secretary of the committee, Mr. Scott. The congress then divided into sections for work.

THE annual meeting of the French Sociétés Savantes commenced on April 16 at the Sorbonne. The general sessions of the Section of Sciences were held under the presidency of M. Milne Edwards, on April 16, 17, and 18. MM. Faye and Wurtz were vice-presidents, and M. Blanchard the secretary. M. Faye delivered a lecture on the 18th in the large hall, on the Great Movements of the Atmosphere. General Nansouty, the Director of the Pic du Midi Observatory, gave an address, in which he complained of the interruptions in the telegraphic communications with Toulouse, caused by the snows during winter, and insisted upon the necessity of placing the wire under ground. M. Ferry, the Minister of Public Instruction, who is president, said that he should take the measures which were asked for by the gallant observer, whose devotion to science was so widely admired in France and abroad. M. Alluard, Director of Puy de Dôme Observatory, presented a series of maps tabulating the readings taken at Clermont Ferrand and on the top of the mountain. An intermediate station has been established. The final meeting of the Congress took place in the large hall of the Sorbonne, under the presidency of M. Ferry, who was assisted by a large number of officials. Five reports were read on the works of the Sociétés Savantes. The Minister, as usual, delivered a speech stating the projects of his administration. The number of learned societies in France is now 360. He stated that the Government spent 11,000,000 frs. in 1870 for the Faculties; the sum was now 30,000,000 frs. The list of rewards granted was then read over. The four gold medalists in science are M. Combercure, of Montpellier, for mathematical disquisitions, M. Dieulafoy, of Marseilles, for geology, M. Coquillon, for determining the quantity of inflammable gas contained in the air of coal-mines, and M. Schrader, for explorations in the Pyrenees.

THE French Physical Society held its annual meeting the other day at the Hotel of the Société d'Encouragement, rue Bonaparte. The *façade* of the hotel was illuminated by a series of twenty-four lamps of the Reynier system fed by three large gramme machines, each of them consuming from three to four horse-power. The effect was regular for several hours, but the illuminating power was very low as compared with ordinary regulators. Among the apparatus exhibited we noticed a rotation machine exhibited by M. Antoine Breguet, to demonstrate that the Gramme machine may be considered as a form of the Barlow rotating wheel. M. Nodot, *preparateur* of the Dijon Faculty of Sciences, exhibited a Barlow apparatus, in which the rotating part is formed by a series of copper wires radially implanted in the centre. M. Deprez exhibited a new motor worked by six Bunsen elements, and which gives about five kilogrammetres per second. This apparatus is analogous to a Wilde electro-magnetic machine. All the principal opticians of Paris, Breguet, Ducretet, Carpentier (formerly Ruhmkorff), Dubosc, Dumontin, Froment, Deleuil, Sauter and Lemonnier, sent in an improved or enlarged form the instruments which have attracted the attention of physicists in recent years. The Faber speaking-machine, which has been attacked by one of the French scientific papers as being worked by a ventriloquist, was exhibited and explained by M. Garrel. The display was considered as one of the most successful that has been offered to the public since the Society was established. The large halls of the hotel were crowded up to a late hour.

SINCE the commencement of the present year, the well-known weekly German botanical journal, the *Botanische Zeitung*, has passed into the sole editorship of Prof. De Bary, of Strassburg.

THOSE interested in British botany will be glad to hear that the threatened extinction of the Botanical Exchange Club, to which we recently alluded, has been averted. Mr. Charles Bailey, of Manchester, has offered to undertake the main responsibility of the curatorship, although the scope of the Club will in future be somewhat restricted. There is a proposal for issuing, in connection with the Exchange Club, a small number of copies of a reference herbarium of British plants, the difficult and critical species being especially kept in view, on the plan of Reichenbach's "Flora Germanica Exsiccata."

THE *Times* Paris correspondent telegraphs that at the sitting of the Academy of Sciences on Monday, it was announced that Lavoisier's chemical apparatus, still preserved by his heirs, but hitherto left unnoticed, had been minutely inspected by Prof. Truchot, of Claremont Ferrand. It is in excellent preservation, and the accompanying documents show that Lavoisier was the author of the work on sea-water distillation published anonymously in England.

AN exhibition of an interesting kind is to be held in Dresden in the summer of this year. This is a general exhibition of objects of art, science, and industry, connected with the education and training of youth. The following are the various classes into which the exhibition will be divided:—1. Teaching material for schools, home, Kindergärten, &c. 2. Printed works, as schoolbooks, children's books, illustrations. 3. Gymnastic and similar apparatus. 4. Musical instruments. 5. Toys. 6. Articles required for children in all departments of industry, as furniture, linen, clothes, orthopædic instruments, &c. A systematic exhibition of the development of various school materials will be connected with the above, and historical objects connected with training and education are therefore desired. A similar exhibition on a small scale in 1877 had a great success. The Committee of the Exhibition consists of one merchant and three teachers. Inquiries should be addressed to Herr Kauf-

mann C. Heinze, Dresden. The Exhibition will be open from July 1 to August 31.

SECONDARY Technical Education forms the subject of the address delivered before the American Institute of Mining Engineers by their president, Mr. Eckley B. Cox, at their Baltimore meeting. Great stress is laid on the necessity of educating workmen, and the maxim, a little learning is a dangerous thing, is combated by the statement that false learning mingling with the truth causes the danger. If the truth of the maxim were admitted we fail to see that it provides a very strong argument against education. A little dynamite is a dangerous thing, but it is of great use in mining work. The author states that they have already five good schools at their works, and proposed to establish another to carry on the education of those boys who have left them to enter the works. While admitting that an average boy cannot work all day and study all the evening, and foreseeing the possibility of making Jack a dull boy, the programme of studies is sketched out "as far as we have been able to arrange it." It comprehends instruction in algebra, geometry, trigonometry, free-hand and mechanical drawing, with descriptive geometry, physics, chemistry, mineralogy, and geology, mechanics and the construction of machines, framing, mining, and mine surveying, English composition, book-keeping, and, last of all, writing. Our astonishment is that not only is arithmetic omitted but lunar and planetary theory have no place assigned to them.

The *Madras Times* writes:—The necessity of a scientific training for coffee planters is now being recognised. Men of intelligence, industry, and steady habits can alone hope to succeed as coffee planters. We would urge upon estate owners the expediency of insisting upon their superintendents and assistants possessing a knowledge of chemistry, sufficient at least for the purposes of coffee planting. They should be able to make analyses of the coffee tree, soil, manures, &c. Planters should also be able to take correct observations of the weather, gauge the rainfall, take notes of the nature and progress of the various diseases the coffee tree is subject to, and so forth. The paper of questions submitted by Mr. Harman to the various coffee planters in Coorg will put their capabilities to the test, and though we are aware that there are many educated and intelligent planters in that province, we fancy some of them will find it no easy task to answer the last of Mr. Harman's questions: Can you give analyses of your rock soil and sub-soil?

ON January 15, 1880, an International Exhibition of products of agriculture, industry, science, and fine arts will be opened at Mexico. The Exhibition will remain open for three months.

THE Anthropological Exhibition at Moscow was opened on the 16th inst. The International Anthropological Congress, connected with this exhibition, will however not meet until August 7 next.

SLIGHT shocks of earthquake were noticed at Montmarault and Chantelle, in the French Department of the Allier, on March 27th. A slight shock of earthquake, lasting about fifteen seconds, and travelling from east to west, was felt at Darjiling at 8.15 on the morning of the 11th ult.

THE death is announced of Mr. William Mudd, the curator of the Botanical Gardens, Cambridge, after a brief illness. The stipend attached to the office is about 100*l.* a year; it is in the gift of the Botanical Garden Syndicate.

MARK W. HARRINGTON, M.A., F.L.S., lately Professor of Astronomy at the Imperial University of Peking, and formerly assistant Professor of Botany at the University of Michigan, has just been appointed Professor of Astronomy and Director of the Observatory at the last-named institution, the chair rendered vacant by the resignation of Dr. James C. Watson, now Professor of Astronomy at the Wisconsin University.

A COURSE of three lectures will be delivered in the Galleries of Natural History and Antiquities, British Museum, on the 24th, 28th, and 30th inst., by Dr. Carter Blake, of Westminster Hospital. Some of the keepers of departments will also give *vivâ voce* explanations of the specimens under their care.

MR. ARTEMAS MARTIN, a well-known American mathematician, has lately commenced the publication of a serial work, entitled *The Mathematical Visitor*, appearing occasionally at intervals of several months. It is published by him at Erie, Pennsylvania, and shows a creditable spirit of enterprise in entering a field which is not generally considered remunerative.

WE have received the first number of the *American Chemical Journal*, which promises to take a high place in scientific literature. Its first object is to collect the good original papers written by American chemists, and to make them the basis of a purely chemical journal, while papers from other journals, and notes in all departments of chemistry will find a place. It is expected that six numbers will appear yearly. The principal articles in the first number are "On the Complex Inorganic Acids," by Dr. W. Gibbs, "On Nitrogen Iodide," by Mr. J. W. Mallet, a paper on Lockyer's hypothesis that the so-called elements are compound bodies, by Mr. C. S. Hastings, of Johns Hopkins University, and "On the Oxidation of Substitution Products of Aromatic Hydrocarbons," by Messrs. Remsen and Hies. There are, besides, several reviews and a number of notes.

THE scientific journals of Pennsylvania express much regret at the possibility of the failure of the Legislature of that State to make appropriations for the continuance of the work of the Geological Survey. This work has been carried on for several years past under Prof. Lesley with great success, and it is so near completion that its cessation now might be considered almost a national calamity.

THE War Department is on the point of at length adopting war balloons into the land and sea services. Movable apparatus for inflating and manipulating military balloons in the field has just been completed in the Royal Arsenal, Woolwich, and been tried with two new balloons, specially constructed for military purposes. The appliances consist of a portable tank, weighing 400 lb., containing iron shavings, together with a portable boiler and furnace. These appliances can be moved about with troops on the field or on vessels at sea. Hydrogen is generated by passing steam through the iron turnings. As soon as the necessary arrangements can be made it is in contemplation to send a few war balloons out to Zululand.

THE boring of an artesian well for the purpose of investigating the nature of the chalk layers through which the submarine tunnel between England and France is to pass was resumed on the French coast at Sandgatte on March 1 last. The depth of the well, which at the end of last year was at 34'35 metres, was extended to 38'50 m.—that is, to a depth corresponding to 8'67 m. below the low-water level. At this depth the flow into the well amounted to 1,300 litres per minute, and the exhaust machines became insufficient. They are to be replaced by more powerful ones.

WE are glad to see that Messrs. Kegan Paul and Co. have published in a handy form a complete translation of Prof. Haeckel's "Freedom in Science and Teaching," first reproduced in this country in our own columns. There is an interesting prefatory note by Prof. Huxley.

A NEW monthly electrical paper has been started in Paris, the *Lumière électrique*, intended as a general organ of electricity.

WE have received from Messrs. Cole and Sons, of Notting Hill, several specimens of pathological, physiological, and educational preparations for the microscope, which for cutting and

mounting surpass anything we have seen. They are really beautiful preparations, and deserve to be widely used.

THE Report of the Marlborough College Natural History Society for the past year is an unusually satisfactory one. Several modifications in the rules have been attended with good results, and the Society seems in a fair way to become a real working one. The papers by the boys and others are highly creditable; perhaps the most generally interesting is that by Mr. Rodwell, on Iceland. The Report of the Winchester and Hampshire Scientific and Literary Society is not quite so satisfactory as could be wished; the *dilettante* and absolutely idle elements seem large, and the Report complains of the indifference to the less popular subjects. We trust that the next Report will be more satisfactory.

Après of electric perforation of glass, Prof. Waltenhofen, of Prague, has recently described the following experiments:—A thin glass plate, having on it a small drop of stearine, is introduced into the spark-path of an electric machine. It is perforated at the part where the drop is, and more easily so when the drop-side is turned to the positive electrode. A glass plate, hung bifilarly between the electrodes of a Holtz machine, is driven by the discharge towards the negative electrode, and more strongly, if the side turned towards the positive electrode be partly covered with stearine. Prof. Waltenhofen considers that the rapidly-moving air-molecules in the spark-path are ruled by a component of velocity directed from the positive to the negative electrode.

THE following subjects in natural science have been proposed by the Society of Arts and Sciences of Utrecht, for prize competition:—1. Researches on the development of one or several species of invertebrates whose history is not yet known. 2. Researches on the influence of small variations in exterior circumstances on the evolution of the embryo of one or several species of vertebrates. 3. Exact anatomical description of the larva and nymph of the common cockchafer (*Melolontha vulgaris*). 4. By what means may the water of rivers which traverse Holland be purified so as to become potable, without any injury to health? What would be the expense of applying them on a large scale? 5. A memoir on the results of experiments made in recent times on the motion of liquids and the resistance they offer to moving bodies; with an exposition (a) of the general or special laws which may be deduced; (b) of the principal points on which some data are still wanting, and the nature of the experiments necessary to obtain them. 6. Critical and experimental study of the functions of the semicircular canals of the ear. 7. Critical and historical study of the theories of electric phenomena observed in muscles and nerves. 8. Critical *aperçu* of the methods employed to determine the place which substituted atoms and groups of atoms occupy in bodies of the aromatic series, according to the theory of the constitution of benzol given by Kekulé and Ladenburg. 9. Determine rigorously the quantities of heat liberated or absorbed in the allotropic change of two or several simple substances. Each prize consists of an honorary diploma and about 25*l.* Papers must be sent in to the Secretary before December 1, 1879.

THE additions to the Zoological Society's Gardens during the past week include three Red Brockets (*Cervus rufus*) from Brazil, presented by Mr. W. H. Lacy; a Blue-faced Green Amazon (*Chrysotis bouqueti*) from St. Lucia, West Indies, a Yellow-fronted Amazon (*Chrysotis ochrocephala*) from Guiana, presented by Mr. Neville Holland; a Black-faced Kangaroo (*Macropus melanops*) from South Australia, three White-eared Conures (*Conurus leucotis*) from Brazil, an Upland Goose (*Bernicla magellanica*) from the Falkland Islands, deposited; a Reeve's Muntjac (*Cervulus reevesi*) born in the Gardens.